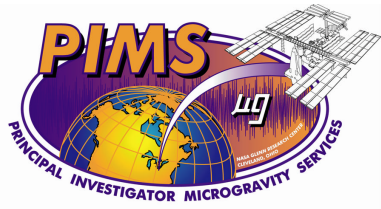


## Implications for Microgravity Experimenters



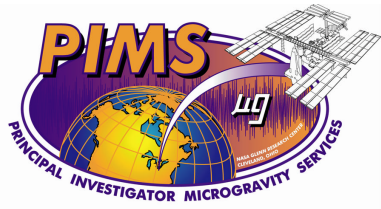
# Section 10: Implications for Microgravity Experimenters

**Presented by:**  
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**NASA Glenn Research Center**



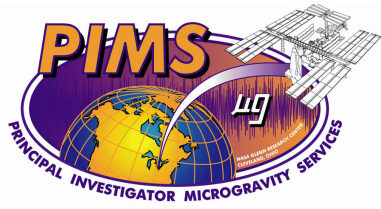
### **Available Microgravity Carriers**

- **Drop Towers**
- **Parabolic Flight Aircraft (KC-135)**
- **Sounding Rockets**
- **STS Orbiters**
- **Free-flyers**
- **International Space Station**



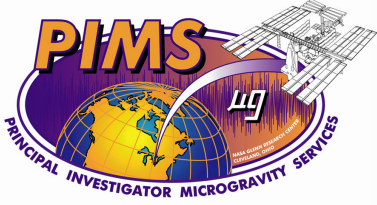
### Experiment Location and Orientation

- **proximity to carrier / vehicle center of mass**
  - sensitivity to quasi-steady variations
- **proximity to other equipment**
  - sensitivity to vibration sources
- **alignment**
  - sensitivity to quasi-steady acceleration direction



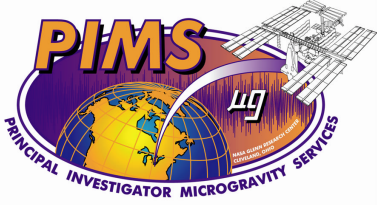
### Carrier Attitude

- **issues related to experiment location**
  - gravity gradient effects
- **issues related to experiment orientation**
  - design attitude that points experiment in desired direction
- **sensitivity to quasi-steady variations with time**
  - atmospheric drag effects
  - local vertical / local horizontal attitudes versus inertial attitudes



# Accelerometer Selection

- **frequency range**
  - cutoff frequency based on experiment sensitivity
  - sampling rate and filter characteristics specified by accelerometer system team to provide frequency selected by experimenter
- **location and alignment**
  - close to experiment sensitive location
  - mounting technique
  - away from sources which may disturb accelerometer and mask disturbances of interest
  - knowledge of sensor orientation relative to experiment axes



### Experiment Timelining

**If at all possible, schedule your experiment operations to avoid any activities which might negatively impact it. Keep the following points in mind:**

- **experiment sensitivity to acceleration sources**
  - quasi-steady, vibratory and transient
- **crew exercise**
- **thruster activity**
- **other experiment operations**
- **crew activity**
- **venting**